



The

Blurb



Newsletter of The Phil-Mont Mobile Radio Club
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May 2002



Memorial Day
May 27

U.S Marines 2002



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The Blurb is published monthly by, and for, the members of **The PHIL-MONT MOBILE RADIO CLUB, INC.** whose purpose is to promote Amateur Radio in general, and Mobile Radio in particular. **Copying and quoting** is permitted with a credit line. We gladly exchange publications with other amateur radio clubs. Requests should be sent to the Editor. **Subscriptions** are available to non-members for \$10, addressed to the Treasurer.

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Send **address and club directory changes** to wb3koj@comcat.com

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Awards: W3WF
Blurb folding: WB3KOJ & WB3KOH
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DX: N3MT

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Field Day: WU3I
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Repeater: W3BBB
Skywarn: WX3PHI
Sunshine: WU3I
Youth: N3MT
TVI: W3VVS
VE Program: ND3Q
W3AA Trustee: WU3I
Welcome: K3CJ.

Directors:

**WU3I (02), W3RM (02),
W3BBB(03), N3MT (03),
N3XKE (02), W3AOK(03),
W3WF (A)**

The club meets at 7:30 PM on the second non-holiday Wednesday of every month at The Franklin Institute Science Museum, Benjamin Franklin Parkway at 20th Street, Philadelphia. Enter from Winter Street or the parking garage on 21st street.

All visitors are welcome!

License Examinations

are held on the first non-holiday Thursday of every month at The Franklin Institute Science Museum. Registration finishes at 6 p.m. Doors close at 6:30 PM-SHARP!

Club Stations

W3AA – The club sponsors this **world-class demonstration station** at The Franklin Institute Science Museum. and welcomes all licensed amateurs to operate.

Trustee: WU3I

Manager: W3STW

email: w3aa@phil.mont.org

packet BBS: 144.99 MHz

w3aa@w3aa.#sepa.pa.usa.noam

W3EM – Field Day and special events station – **Trustee W3VVS**

W3QV – Club Repeater

Ridge & Port Royal Avenues, Philadelphia, PA

Trustee: W3BBB

**147.03 MHz + PL 91.5 Hz
444.80 MHz rx PL 186.2 Hz
Club Simplex: 147.51 MHz**

Sunday Morning Net Schedules

- **2 Meter Net** at 09:30et on W3QV repeater
- **10-on-10 Net** at 10:00et 28.393 MHz USB (±QRM)
- **75 meter Net** at 10:20et 3.993 MHz LSB

Digital Modes in Amateur Radio

de Maggie Leber K3XS

In one sense, radio communications began as a digital mode. Originally, a **spark gap** transmitter could only be switched on or off, spewing out a **very** wideband RF signal...the radio equivalent of banging on a hollow log.

In his epic history of amateur radio, *The Wayback Machine*, Bill Continelli, **W2XOY** says "The signal generated was extremely broad. A "state of the art" 1906 spark transmitter operating on 400 meters (750 kHz) would actually generate a signal from about 250 meters (1200 kHz) to 550 meters (545 kHz). Receivers were no better. Before 1912, all systems were basically unamplified detectors. Tuners were primitive or nonexistent. As might be expected, by today's standards, the early wireless stations were terribly inefficient. Transmitting ranges varied from as little as 600 feet with a 1/2 inch coil to perhaps 100 miles from a kilowatt station and a 15 inch spark coil. Ships at sea with 5 KW transmitters might get as much as 500 miles maximum range."

Still, this **was** communicating, even if it took a mind trained to send and receive Morse code at both ends of the conversation to actually get a message across. And when amateur Edwin H. Armstrong began experimenting in 1912 with the early "Audion" vacuum tube, it became possible to create a vastly more sensitive receiver, as well as a transmitter that would emit a (relatively) pure tone on a (more-

or-less) single frequency, giving birth to "continuous wave" or **CW** transmission, our second digital mode.

In fact, it was the need to get a message to a ham (who had an Audion for sale) that led Hiram Percy Maxim to found the Amateur Radio Relay League. The ham was only thirty miles away, and yet he was unreachable with Maxim's **1 kilowatt** spark signal!

Narrow-band CW signals that the Audion tube could transmit and receive were so vastly more efficient than spark that spark operation was nearly extinct by the mid-1920s. CW telegraphy **was** amateur radio in those days, allowing thousands of stations to operate peacefully within the 150 to 250 meter band then in use. (A few die-hards continued to run their spark stations in the beginnings of a perennial conflict between hams who see the hobby as a museum, and those who see it as a laboratory.)

Our first **non**-digital mode was AM radiotelephone (even though Armstrong also invented FM radio), and finally it was no longer necessary to have a Morse-trained brain at either end of the QSO to decode the digital stream. AM signals slurped up a fair amount of bandwidth (about 10 kHz), and

wouldn't be displaced by more efficient single-sideband radio telephony until the 1950s.

Meanwhile, a number of efforts had been made to introduce some mechanical automation to telegraphy. Both Thomas Edison and Alexander Graham Bell started out as wire telegraph operators, and both bent their efforts to mechanically receiving these primitive digitally encoded messages. Their early efforts met with uneven success, since the proportionally-timed Morse code is well-suited to being decoded by a human operator but highly difficult to decode mechanically.

One practical result of these efforts result was the stock ticker, a device that mechanically decoded digital signals, and printed the messages on a strip of paper. The Universal Stock Ticker (a refinement of earlier designs by others) was Edison's first commercial success, establishing his reputation with investors (which is never a bad thing for an inventor!)

As time passed, commercial applications of automatic mechanical telegraphy drove the development of reliable equipment, largely automating the rapid transmission of written messages over telegraph circuits for financial, telegram, and meteorological

Special notice! Mark your calendar!
Due to a scheduling conflict
The May PMRC General Meeting will be held
on **May 15th**



A postwar era Model 15 Teletype

traffic.

Of course, there was demand to make the advantages of automation enjoyed by wired telegraphy available on *wireless* telegraphy as well, especially for military and aeronautical applications. Even though not every military radio station could accommodate finicky mechanical monsters weighing hundreds of pounds, those that could (at fixed bases and shipboard installations in particular) could carry reams of radio message traffic without the need for Morse-trained human operators. It wasn't long before the possibilities of automatic mechanical encryption for military traffic became obvious, too.

At the end of the Second World War, mechanical teletypewriter and radioteletypewriter (**RTTY**) equipment became available on the surplus market along with other military surplus radio gear, and reached the hands of amateur operators, (many of them war veterans themselves) who were able to devote the loving care needed to keep the somewhat finicky mechanisms operating. And while the smell of hot oil, the hum of electric motors and the clatter of

selector bars and print heads still conveyed to many the romance of this era of communications, the expense and complexity of the equipment was an obstacle to its wide use in amateur circles.

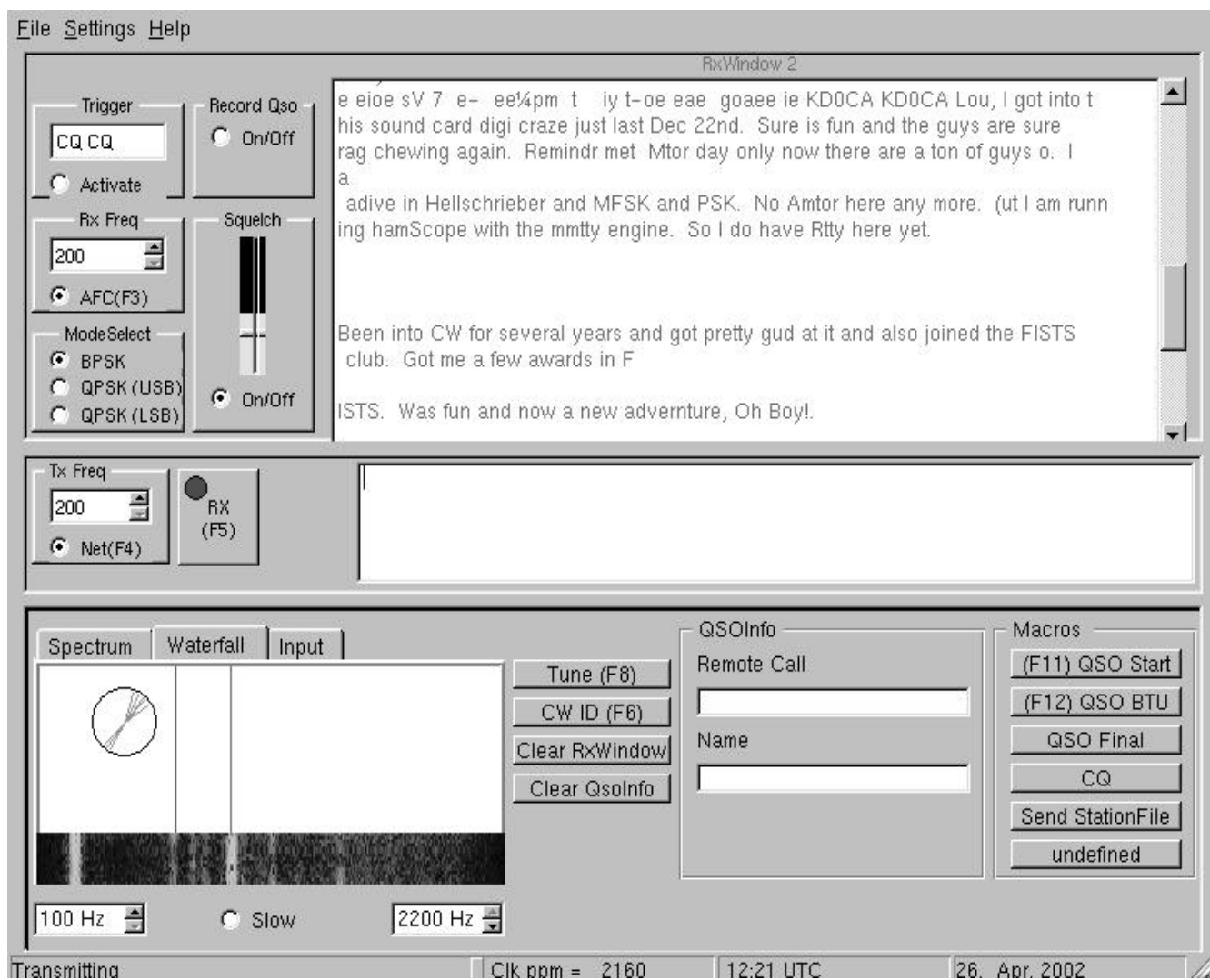
With the microelectronics revolution of the 1970s and 1980s, it wasn't long before mechanical teleprinters began to be displaced from commercial usage, and the demand for digital terminals for use with computer systems led to development of purely electronic digital encoding and decoding circuits, along with video-tube based systems that slashed the cost of equipment to display a digital message for reading. Personal computer systems such as the Radio Shack TRS-80 and Commodore 64 became the core of many ham RTTY stations, since only a software program and a modulator/demodulator (MODEM) circuit were required to put a RTTY signal on the air.

The information processing capabilities of this new electronic technology made it possible to begin attacking a perennial weakness of RTTY transmission on HF frequencies: its vulnerability to fading and noise. **AMTOR** and **PACKTOR** systems came into use that used redundant encoding techniques to detect and automatically request retransmission of garbled transmissions, and assemble (mostly) perfect copy at the receiving end. Multimode communications controllers by manufacturers such as Kantronics and AEA began to emerge that could operate in many digital modes, including Morse CW.

Meanwhile on the VHF bands, digital **packet radio** technology was developed in the early 1980s. Automatically addressed, routed, relayed and error-corrected data could be passed among stations sharing a single local frequency, and an HF backbone network allowed message traffic to traverse great distances or to be gated to terrestrial electronic mail networks, just then emerging at the time. Widespread amateur adoption of AX-25 network protocols fostered interoperability, and allowed the orderly addition of new protocols to the existing network. Hank Oredsen, **W0RLI** developed systems for message store-and-forward "bulletin board" (BBS) systems, while others created packet network systems for sharing propagation, and DX spotting information.

More recently, Bob Bruninga, **WB4APR** created the "Automatic Position Reporting System" standards, which ride on existing AX-25 technology. APRS provides facilities especially suited for mobile operation, including automatic GPS position and status reports, short text message and bulletin relay, weather reporting and severe weather warnings. APRS data also rides on the terrestrial Internet, and is relayed by several spacecraft in low-Earth orbit, including the International Space Station, providing a messaging capability to low-power portable VHF stations anywhere on the planet. Kenwood, in particular, has been at the forefront of building packet and APRS capabilities directly into their amateur equipment.

Yet another technical revolution



A typical PSK-31 display

takes us further along the "faster, better, cheaper" road in digital communications, as amateurs developed personal computer software that allows operation in digital modes with minimal or no special interfacing equipment. A new opportunity emerged as personal computers evolved higher quality audio interfaces called "soundcards", (although the audio devices are now frequently built directly into the main circuit board or "motherboard" of the computer).

By placing the encoding and decoding logic completely in software routines using **digital**

signal processing (DSP)

techniques, a single bidirectional audio path between computer and radio (usually with an additional control line to allow the computer to automatically key the transmitter) can be used to operate in **any** digital mode in use today: CW, RTTY, PACTOR, VHF packet radio, as well as other image-based systems (such as slow-scan TV (SSTV), facsimile (FAX) and Hellschriber) that are not, strictly speaking, digital modes.

DSP techniques are also useful for recording QSOs, automatically making voice transmission during

contests ("voice keyer" operation) and analyzing received signals visually as oscilloscope or spectrograph displays. All these capabilities are available to a "soundcard-based" station simply by running different software, no switching of signal paths between external equipment is required. This provides extraordinary operational flexibility.

Having almost complete freedom over signal encoding and decoding has also led to great leaps forward in adopting digital signals to the particular characteristics of various kinds of radio operation. An amateur experimenter, Peter

Martinez **G3PLX**, (the originator of the **AMTOR** HF protocol) developed a low-data-rate phase-shift keying system specifically aimed at optimum performance for keyboard-to-keyboard QSOs on the HF bands, called **PSK-31**.

Adoption of this new mode was slow until soundcard software became widely available, resulting in a whirlwind adoption of the mode among RTTY enthusiasts and drawing thousands of new operators into their first experiences with digital radio.

PSK-31 signals have exceedingly narrow (31Hz!) bandwidth requirements, and therefore require minimal RF power to be copyable. In fact, PSK-31 signals that are inaudible on the air and detectable only by eye on the DSP-based "waterfall" spectrographic display provided by most PSK-31 soundcard programs can be copied clearly. For the first time, a new mode is challenging CW telegraphy for performance under noisy or weak-signal conditions.

Another new digital mode **MFSK-16**, developed by Murray Greenman **ZL1BPU**, drawing on the Coqulet and Piccolo multifrequency keying systems commonly used for European diplomatic and military traffic in the 1950s and 1960s. (Murray is also active in experimentation with many other non-voice radio modes.)

MFSK-16 has advantages over PSK-31 in that it has automatic error correction, and being frequency- rather than phase-keyed, it is relatively immune to phase distortion common to multiple hop DX paths. On the

downside, the error-checking introduces brief decoding delays that can slow down a keyboard-to-keyboard QSO, and a somewhat wider bandwidth (316Hz) is required. As yet, it is less-widely used than PSK-31, but switching from one mode to the other requires only loading a different program into the station computer.

"Soundcard" software is also available for the **WSJT** mode crafted for use over the highly intermittent VHF propagation paths provided by RF scattering from the ionization trails of meteors as they enter the Earth's atmosphere.

If all this innovation isn't enough, just down the road the advent of "software defined" radios will more closely couple the IF stages of receivers and transmitters to the DSP facilities of user-programmable devices, creating exciting possibilities for experimentation and development of new techniques for using radio spectrum.

Who says ham radio is dying? I say there's exciting new things being done all around us.

Diving for DX **with W3RM and N3MT** **Aruba SCUBA DXpedition:** **May 29 thru June 19**

The Blurb has learned that Mike, **N3MT**, and Dick, **W3RM**, are again planning a warm-up dx-pedition to get in shape for those 40-meter Field Day contacts. Last year they selected Providenciales Island, in the British Turks and Caicos Islands (VP5), for its warm,

clear scuba diving waters, and the availability of a well equipped ham station.

Using the same criteria this year, they have picked the Dutch island of Aruba (P4), 15 miles off the north coast of Venezuela, South America. The reef and wreck diving off Aruba is reputed to be excellent....and they will have the full use of Carl Cook's **P49V** contest station for operation on all bands, 160 through 6 meters.

The two operating positions are equipped with a Yaesu FT-1000-D, Icom 756-PRO, and Alpha 87A amplifier. Three towers support individual mono-band beams on 40, 20, 15, 10 and 6 meters, and a Force-12 C31XR tri-band beam (14 elements) on 20, 15 and 10. There are wire antennas on 80 and 160.

The "DTZ" (Dutch "FCC") has confirmed Dick's and Mike's applications by fax, and on arrival in Aruba, they will pick up their Dutch licenses, with the calls **P40RM** and **P40MT**.

During their three weeks on Aruba, they plan to divide their time between hamming and Scuba diving. As usual, they will work CW primarily, on the low end of the CW sub-bands. But they also expect to get on phone daily, and would appreciate contacts with Phil-Monters on both modes...most likely on 20, 15 and 10, and, conditions permitting, on 6 meters. Look for **P40MT** and **P40RM** beginning May 29 through June 19.

(Once again, they expect to be back home just in the nick of time for Field Day.) AR



Field Day de WU3I

Well I hope you all have read the May QST article on the new FD Rules(Page 108). Actually the rules change very little from year to year but some new things are added for this year. I picked up a set of UHF and VHF Satellite Antennas we will use for FD before they make to my roof so we will be better there.

By the time you read this the order for Tee Shirts and Pins will be in and you will have missed the boat.

Now that the Shirt and Pin List has been put to rest It's Time to get the Attendance list together. I will need to know that you plan to attend and which meals if not all you will attending. The list is

Saturday Lunch
Saturday Dinner
Sunday Breakfast
Sunday Lunch

Let me know so I can do the shopping

W3AA Report

The 950 is back. Finally the Kenwood 950 is back. Repaired and returned it is installed and humming along just fine. As far as the special event goes there were 126 contacts logged and 20 Certificates made. Those for members will be given out at club functions(some have already). If you have not got yours and you contacted the Station contact WU3I in all the regular manners. I still have not heard about the Kenwood 570S but the Alinco(thanks Rollie) is in it's place for Six Meters and HF operation. All else is working well.

April Philmont Board Meeting

The April meeting was held at the home of Steve **WU3I** and Joanne **N3FTC**. In attendance were Steve **WU3I**, Ted **KB3HAQ**, Ed **KB3IV**, Al **W3STW**, Gene **N3XKE**, Gwen **NG3P**, Maggie **K3XS**, Fred **WA3KIO**, Bill **W3AOK**, Mike

K2BN, Jim **W3BBB**, and Dick **W3RM**.

Treasurers Report: Mike **K2BN** reported that we are doing better than last year at this time. We have more dues.

Net Control: Ed **KB3IV** reported that all the nets are running well. Anyone interested in becoming a net control should see Ed.

Upcoming meeting: Al **W3STW** reported no changes for HT night. The participants are listed in the Blurb. The audience will do judging.

After the summer break a permanent meeting spot for mid-months will be discussed.

Repeater: Jim **W3BBB** reported that the repeater is working but the controller is on the bench. Adjustments should be done by the weekend.

Scholarship: Dick **W3RM** reported that May 1 is the deadline for getting applications. Applications are still going out at this point. We will know the winner of Philmont's scholarship by mid-June. Field Day: Steve **WU3I** will be placing an order Field day shirts and pins. A motion was made by Bill **W3AOK** for the club to make \$2.95 reimbursement. Al **W3STW** seconded it. The shirts will cost \$10.00 to Field Day participants. **W3AA**: everything is status quo for the moment.

Al **W3STW** made a motion to adjourn the meeting. Dick **W3RM** seconded it. Meeting was adjourned at 9:20. Thank you to our hosts,

Steve and Joanne.
73 de **WA3KIO**

PMRC April General Meeting

Charley **K3CJ** reported 22 people in attendance.

Ed opened the meeting held at the Franklin Institute.

He thanked all the net controls and everyone member or non-member is invited to check in. If anyone would like to become a net control for any of the nets, see Ed **KB3IV**.

Steve **WU3I** reported on Field Day and is taking orders for pins and tee shirts. The club is picking up \$2.95 and the shipping costs on the shirts. There will be only one order. See Steve before May 1.

Field day will be held at the same place as in the past.

The Kenwood 950 is back in **W3AA**. Steve is looking for another person to take over as Sunshine Person. The first page on the Website has been redone with thanks to Maggie **K3XS** who also built the Scholarship Page. There will be **MS150** updates posted there shortly. Dues are way overdue.

This is Hamfest season. There will be listings elsewhere in the Blurb for up and coming ones.

Repeater: The controller is being worked on at present and will be returned to service shortly.

There are upcoming public service events. These will be listed in the Blurb elsewhere. Be sure and volunteer for what you are able to.

N3MT reported on DX. On the youth committee, Mike introduced students from the Overbrook School For The Blind and new member Josh Bowers **KB3HPS**.

Congratulations were given to the

group of new license holders who recently passed their tests at Philmont's last VE session.

The meeting was adjourned and turned over to our Vice-President Al **W3STW** and HT night.

73 de **WA3KIO**

PMRC HT night

And the winner is...**KB3HPP**, Chris.

Based upon the congratulatory and positive comments from those attending P.M.R.C.'s HT night was a success.

The FCC's recent changes to the requirements to obtain an Amateur Radio license has opened the door to those seeking to become a licensed Amateur Radio Operator.

In the same spirit, making it easier to stay on the air, the P.M.R.C. sponsored a contest in which participants would give a short talk about their HT and the participant giving the best presentation would be given a brand new HT.

Each participant's name was placed on a ballot and the ballot then distributed to the general audience. At the end of all presentations the audience was asked to vote on a winner. **W3AOK** Bill and **N3OWM** Ted collected the ballots and the count was tallied by



196th Monthly Phil-Mont

VE Exam Session Statistics

for April 4, 2002

Five candidates took seven elements, and we had three upgrades and two new hams. The VE team was chaired by Dusty Rhoads **ND3Q**, and the other participating VEs were :

Harold Goodman **W3UWH**

Jim McCloskey **NS3K**

Jeff Kerber **N3VE**

Bob Freer **W3YLT**

Pete Butler **WB2B**

Upcoming Exam Sessions:

May 2, 2002-June 6, 2002

SPECIAL NOTICE :

Second Thursday of the month July 11, 2002, due to Fourth of July Holiday.

(See page 2 for details)

W3STW Al and Ted.

Congratulations to **KB3HPP** Chris who received his license in February of this year and his mentor is **W3AOK** Bill.

Chris faced some of P.M.R.C.'s finest orators namely **KB3IV** Ed, **WU3I** Steve, **WB0CPR** Carl, **KB2ERL** Bob and also had to do verbal battle with **N3RPW** Jerry and **KH6WD** Gary.

One of the evenings highlights was Gary's FT-50RD Yaesu HT it was programmed to announce the statement that most of

us that use a repeater dread hearing when we un key the mic and that is 'repeater time out'. It was programmed for speakers that had gone over the allotted time which was eight minutes. Thanks to Gary no one got that announcement. Many thanks to all attending for a most enjoyable P.M.R.C. General Meeting.

73 Al W3STW.

VE Examination Sites

Confirm all information, in advance, with the contact person. Licensed applicants must bring the original, and one photocopy of their license. All applicants, including children, must show two other types of ID. Bring the original, and a copy of any Certificate of Successful Completion needed to prove current status. The ARRL VEC's 2001 test fee is \$10.00.

TELFORD, PA R F Hill Amateur Radio Club, Inc. Elmer Allen, Jr., K3LNV
215-257-2009 elamaral@bellatlantic.net
Third Monday of the month. Testing starts promptly at 6:30 pm.

WARMINSTER, PA Tom Michaud,
WA3TQJ, 215-343-3494

WILMINGTON, DE Giselle Wells, 302-478-2757

THE FRANKLIN INSTITUTE Monthly,
1st Thursday Dusty Rhoads, ND3Q.
215-879-0505, day. 215-448-1139 24-hours. Doors open at 6PM and close sharply at 6:30 PM.

BELLMAWR, NEW JERSEY Diane Nafis, 856-227-6281. Testing is the third Thursday of the month at 6:30 PM. They meet at the Bellmawr Municipal Complex, Browning Rd. and Lewis Ave., one block off Black Horse Pike, Route 168.

BRISTOL, PA George LeNoir, 215-943-4886

LEVITTOWN, PA David L. Heller,
215-946-1040



May Birthdays

05 Paul Policarpo – N3PP
09 Carol Sebzdz – W3CLS
12 Bob Henderson – WR2H
17 Herb Scott – N3OLK
18 Mike Morgan – W7MM
20 Bob Field – W3INW
Dick Malone – N3MGS
23 Joe O'Donnell – N3RCQ
26 Bonnie Malone – WB3GBN
Carol Mihm (XYL KE3PR)
29 Maggie Leber – K3XS
Dave Martin – WA1ZGE
30 Bill Chedeville – W3GQD
31 Heidi Mescanti – (XYL WB3KUR)

Callsign Changes:

N3CTA to W3ML(w3ml@netcarrier.com)

N3PVO to W3CLS

Rejoined:

KB3ANO & N3YNH

Don't forget! 2002 Licence Expirations:

August.–KE3QB

October–KB3AFH

Membership Stats:

At press time P.M.R.C. has:

117 Full paid members

14 Family members

3 Youth members (under 17)

2 Honorary members

1 Pending member:

Harry R. Eberlin WA3AZS (Tech w/HF)

212 W. Allegheny Ave. Philadelphia PA 19133

Occupation: ELECTRONICS/RETIRED

Home: 215-634-3906 Work: 215-747-7887

Committees: DX, Field Day, Repeater & Tech, TVI

Special notice!
 Mark your calendar!
 Due to a scheduling conflict
 The May PMRC General Meeting
 will be held on **May 15th**

Looking ahead...

We're planning on topics to focus on
 in future issues:

June	Field Day (of course)
July	DX and paper chasing
August	Satellites and space
September	MS150 and public service

We're always open to input and
 suggestions for topics of interest to our
 readers, and welcome submissions. Drop
 your editors a line at k3xs@arrl.net

May 2002		
Date	Event	Comments
Wed 01		PMRC Board of Directors meets
Thu 02		Licence Exams -- 6 pm -- see Page 2
Fri 03		
Sat 04		
Sun 05	MS Walks	NCS: 2m K3XS 10m:W3AA 75M:W2AJV
Mon 06		
Tue 07		
Wed 08		<u>NO</u> PMRC MEETING TODAY !!!! See 5/15
Thu 09		
Fri 10		
Sat 11		
Sun 12	Mother's Day	NCS: 2m KB3FHF 10m:W3AA 75M:WA3KIO
Mon 13		
Tue 14		
Wed 15		PMRC General Meeting--see Page 2
Thu 16		
Fri 17		
Sat 18		
Sun 19		NCS: 2m KB3IV 10m:W3AA 75M:KB3IV
Mon 20		
Tue 21		
Wed 22		
Thu 23		
Fri 24		
Sat 25		
Sun 26		NCS: 2m WB3KOJ 10m:W3AA 75M:NG3P
Mon 27	Memorial Day	
Tue 28		
Wed 29		
Thu 30		
Fri 31		

First Class Mail

The Phil-Mont Mobile Radio Club, Inc
 641 Kismet Road Philadelphia PA 19115

The Blue